

UNCLASSIFIED

PE NUMBER: 0604602F

PE TITLE: Armament/Ordnance Development

Exhibit R-2, RDT&E Budget Item Justification

DATE

May 2009

BUDGET ACTIVITY

05 System Development and Demonstration (SDD)

PE NUMBER AND TITLE

0604602F Armament/Ordnance Development

Cost (\$ in Millions)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost to Complete	Total
Total Program Element (PE) Cost	7.558	2.089	18.671	0.000	0.000	0.000	0.000	0.000	Continuing	TBD
3133 Armament Subsystems	7.558	2.089	11.986	0.000	0.000	0.000	0.000	0.000	Continuing	TBD
5361 Stores-Aircraft Interface	0.000	0.000	6.685	0.000	0.000	0.000	0.000	0.000	Continuing	TBD

FY2008 funding total includes \$3.870M in supplemental funding.

In FY2008, all funds and activities from Projects 4696 Armament Standardization and 5613 Containers moved to Project 3133 Armament Subsystems (new name, old name was Bombs & Fuzes). This was done to consolidate and simplify the program element.

In FY 2010, Project 5361, Stores-Aircraft Interface (new), efforts were transferred from PE 0605011F, RDT&E for Aging Aircraft, Project 654685, Universal Armament Interface (UAI), in order to properly fund the maturing technology.

(U) **A. Mission Description and Budget Item Justification**

The Armament Ordnance Development program provides for initial and continuing development of weapons/munitions (kinetic and non-kinetic) and munitions equipment for support and operational use. This PE develops and improves the following weapons and weapons subsystems: bomb fuzes, insensitive explosive fills (Insensitive Munitions - IM), aircraft ammunition, stores-aircraft interface upgrades to include the Universal Armament Interface (UAI), directed energy technology transition to weapons, munitions materiel handling equipment (MMHE), munitions containers, and other weapon subsystems.

Armament Subsystems: This project develops and improves conventional weapons/munitions (kinetic and non-kinetic) and fuzes. The project also provides an opportunity to quickly insert emerging technologies into existing and developing aircraft munitions. It currently includes enhancing and improving the reliability of the Joint Programmable Fuze (JPF), integration of the JPF on legacy weapons, and other fuze development, notably the Hard Target Void Sensing Fuze (HTVSF) Joint Capability Technology Demonstration (JCTD). The project helps the AF meet Insensitive Munitions (IM) compliance through strategic planning, development of an insensitive explosive fill, and bomb case modifications for MK-80 and BLU- series bombs to make these weapons insensitive to unplanned stimuli. Armament Standardization/Control/Munitions Materiel Handling Equipment (MMHE) is a continuing project to develop and improve the standardization and commonality of munitions handling and armament equipment to preclude duplication. This project also funds the operation of the tri-service Container Design Retrieval System (CDRS). This maintains a container database to preclude proliferation and duplication of munitions containers. It also supports organic container design, acquisition transportation, prototyping, testing capabilities, as well as the Joint Ordnance Commander's Working Group (JOCG) for Packaging, Handling, and Loading.

Stores-Aircraft Interface: This project conducts stores-aircraft interface upgrades and standards development to include the Universal Armament Interface (UAI). UAI is an Air Force initiative to develop standardized software interfaces in aircraft, weapons and mission planning to support integration of future weapons independent of aircraft Operation Flight Program (OFF) cycles.

This program is in Budget Activity 5 - System Development and Demonstration because the projects support the SDD phase of several munitions related items and

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Exhibit R-2 (PE 0604602F)

Exhibit R-2, RDT&E Budget Item Justification

DATE

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BUDGET ACTIVITY

05 System Development and Demonstration (SDD)

PE NUMBER AND TITLE

0604602F Armament/Ordnance Development

functions.

(U) **B. Program Change Summary (\$ in Millions)**

	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
(U) Previous President's Budget	3.165	2.095	2.117
(U) Current PBR/President's Budget	7.558	2.089	18.671
(U) Total Adjustments	4.393	-0.006	
(U) Congressional Program Reductions			
Congressional Rescissions		-0.006	
Congressional Increases	3.870		
Reprogrammings	0.591		
SBIR/STTR Transfer	-0.068		

(U) **Significant Program Changes:**

FY2008 funding total includes \$3.870M in supplemental funding. The Air Force also reprogrammed funds to support Insensitive Munitions (IM) strategic planning (\$0.350M) and for the Hard Target Void Sensing Fuse (HTVSF) (\$0.241M).

In FY 2010, the program received additional funding in the amount of \$10.1M for the Hard Target Void Sensing Fuse (HTVSF) Joint Capability Technology Demonstration (JCTD).

In FY 2010, the program also received a funding transfer in the amount of \$6.8M from PE 0605011F, RDT&E for Aging Aircraft, for Universal Armament Interface (UAI) efforts in order to properly fund the maturing technology.

Exhibit R-2a, RDT&E Project Justification

DATE

May 2009

BUDGET ACTIVITY				PE NUMBER AND TITLE				PROJECT NUMBER AND TITLE		
05 System Development and Demonstration (SDD)				0604602F Armament/Ordnance Development				3133 Armament Subsystems		
Cost (\$ in Millions)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost to Complete	Total
3133 Armament Subsystems	7.558	2.089	11.986	0.000	0.000	0.000	0.000	0.000	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0		

FY2008: funding total includes \$3.870M in supplemental funding

In FY2008, all funds and activities from BPACs 4696 Armament Standardization and 5613 Containers moved to BPAC 3133 Armament Subsystems (new name, old name was Bombs & Fuzes). This was done to consolidate and simplify the program element.

(U) **A. Mission Description and Budget Item Justification**

The Armament Subsystems BPAC contains a variety of work:

- Bombs/munitions and fuzes. The Joint Programmable Fuze (JPF) was developed primarily for JDAM and funded by the JDAM program. This project funds the integration of JPF on other AF legacy weapons and improvements to the JPF program, including reliability enhancements and producibility improvements. In addition, the project supports other fuze development activity, including characterization of the Hard Target Void Sensing Fuze (HTVSF), and AF participation in the DOD Fuze Integrated Product Team (IPT). This project is also conducting an Eglin Steel Producibility Enhancement (ESPE) for warhead manufacture (the BLU-122).
- Insensitive Munitions (IM). IM develops explosive fill and bomb case modifications to make conventional weapons insensitive to unplanned stimuli. The project also supports AF IM strategic planning to achieve IM compliance IAW U.S. Code, Title 10, Subtitle A, Part N, Chapter 141, Section 2389, "Ensuring safety regarding insensitive munitions."
- Munitions Materiel Handling Equipment (MMHE) and Container Design Retrieval System (CDRS). Armament Standardization/Control/Munitions Materiel Handling Equipment (MMHE) is a continuing project to develop and improve the standardization and commonality of munitions handling and armament equipment to preclude duplication. Efforts are limited to the study, design, and development of MMHE and armament control systems. Procurement will be performed and funded by the applicable weapons system project. The tri-service Container Design Retrieval System (CDRS) is a database intended to preclude proliferation and duplication of munitions containers. It also supports organic container design, acquisition transportation, prototyping, testing capabilities, as well as the Joint Ordnance Commander's Working Group (JOCG) for Packaging, Handling, and Loading.

This project is in Budget Activity 5 - System Development and Demonstration (SDD) because the projects support the SDD phase of several munitions related items and functions.

(U) <u>B. Accomplishments/Planned Program (\$ in Millions)</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
(U) Hard Target Void Sensing Fuze (HTVSF) Joint Capability Tech Demo (JCTD)	4.111		9.930
(U) I-1000 Warhead Technology Demonstration	1.166	0.000	
(U) JPF legacy weapons integration and other fuze activity. Conduct UAI activities.	0.614	0.749	0.738
(U) Design, prototype, test and develop various Munitions Material Handling Equipment (MMHE) projects for AF use	1.029	1.170	1.150
(U) Provide container design expertise and technical support to AF munitions/weapons containers developers. Manage and operate the Tri-Service Container Design Retrieval System (CDRS) database.	0.143	0.170	0.168
(U) Development planning/transition: Insensitive Munitions (IM) strategic planning, Eglin Steel Producibility	0.495		

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Project 3133

Exhibit R-2a (PE 0604602F)

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Exhibit R-2a, RDT&E Project Justification

DATE

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BUDGET ACTIVITY

05 System Development and Demonstration (SDD)

PE NUMBER AND TITLE

0604602F Armament/Ordnance
Development

PROJECT NUMBER AND TITLE

3133 Armament Subsystems

(U) **B. Accomplishments/Planned Program (\$ in Millions)**

Enhancement (ESPE)

FY 2008

FY 2009

FY 2010

(U) Total Cost

7.558

2.089

11.986

(U) **C. Other Program Funding Summary (\$ in Millions)**FY 2008FY 2009FY 2010FY 2011FY 2012FY 2013FY 2014FY 2015Cost toTotal CostActualEstimateEstimateEstimateEstimateEstimateEstimateEstimateComplete

(U) RDT&E AF, PE 0604635F

Ground Attack Weapons Fuze

Development, R-1 Line Item

No. 57

Funds SDD follow-on for the HTVSF JCTD

18.778

Continuing

TBD

(U) **D. Acquisition Strategy**

Fuzes (including JPF) is a continuing effort with most activities performed in-house or through contracted services (small contracts). HTVSF JCTD is a two-contractor competition leading to down-select for SDD.

MMHE and container project activities performed in-house with limited technical and analysis contract support.

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Exhibit R-3, RDT&E Project Cost Analysis

DATE

May 2009

BUDGET ACTIVITY				PE NUMBER AND TITLE					PROJECT NUMBER AND TITLE			
05 System Development and Demonstration (SDD)				0604602F Armament/Ordnance Development					3133 Armament Subsystems			
(U) Cost Categories (Tailor to WBS, or System/Item Requirements) (\$ in Millions)	Contract Method & Type	Performing Activity & Location	Total Prior to FY 2008 Cost	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	FY 2010 Cost	FY 2010 Award Date	Cost to Complete	Total Cost	Target Value of Contract
(U) Product Development												
Kaman Precision Products, Inc. (JPF)	FPIF	Orlando, FL	9.020	0.208	Oct-07	0.200	Oct-08	0.197	Oct-09	Continuing	TBD	8.699
Wright Patterson AFB (JPF Mantech Effort)	In-house	Wright Patterson AFB, OH	0.524	0.233	Dec-07	0.250	Oct-08	0.246	Oct-09	Continuing	TBD	
Picatinny Arsenal, NJ (ESPE)	CPFF	Various	6.334	0.000						0.000	6.334	TBD
Air Force Research Lab/RWF - Support (ESPE)	In-house	Eglin AFB, FL	0.180	0.090	Jun-08					0.000	0.270	TBD
Air Force Research Lab/RWF - Contracts Support (ESPE)	CPFF	Various	0.520	0.000						0.000	0.520	TBD
Air Force Research Lab/RWM - Support (IM)	In-house	Eglin AFB, FL		0.170							0.170	
General Dynamics (I-1000)	FFP	Niceville, FL	0.000	0.714	Jul-08					0.000	0.714	TBD
Alliant Techsystems		Minneapolis, MN		1.593	Apr-08			3.674			5.266	
Thales Electronics		Basingstoke, UK		1.593	Apr-08			3.674			5.266	
96 LRS	In-house	Eglin AFB, FL	0.015	0.017		0.016		0.016		Continuing	TBD	TBD
EDSC	In-house	Eglin AFB, FL	0.006	0.000		0.007		0.007		Continuing	TBD	TBD
Prototype Fabrication Shop	In-house	Eglin AFB, FL	0.234	0.223		0.242		0.209		Continuing	TBD	TBD
Subtotal Product Development			16.833	4.840		0.715		8.023		Continuing	TBD	TBD
Remarks:	Kaman Dayron changed its name to Kaman Precision Products											
(U) Support												
AAC/XR (IM, I-1000, ESPE))	In-house	Eglin AFB, FL	1.591	0.687						0.000	2.278	1.761
TEAS/TAMS				0.374				0.767			1.141	
ECO & GFE	In-house	Eglin AFB, FL						0.502			0.502	
AAC/679 ARSS (Progam Office - Fuzes)	In-house	Eglin AFB		0.137				0.473			0.610	
External Support (HTVSF: ManTech, Stratcom, AFOTEC, Safety)	In-house			0.287				0.837			1.124	
AAC/688 ARSS (Program Office - MMHE)	In-house	Eglin AFB, FL	0.882	0.789		0.905		0.921		Continuing	TBD	TBD
AAC/688 ARSS (Program Office - Containers)	In-house	Eglin AFB, FL	0.157	0.143		0.170		0.168		Continuing	TBD	TBD
Subtotal Support			2.630	2.417		1.075		3.668		Continuing	TBD	TBD
Remarks:	TEAS/TAMS contractors provide support to the System Program Office (SPO) for technical (TEAS) and management/financial (TAMS) services. FFP = Firm Fixed Price											
(U) Test & Evaluation												
46th Test Wing (Fuzes)	In-house	Eglin AFB, FL	0.516	0.301	Oct-07	0.299	Oct-08	0.295	Oct-09	Continuing	TBD	TBD
Subtotal Test & Evaluation			0.516	0.301		0.299		0.295		Continuing	TBD	TBD
Remarks:												
(U) Total Cost			19.979	7.558		2.089		11.986		Continuing	TBD	TBD

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Exhibit R-3 (PE 0604602F)

Exhibit R-4, RDT&E Schedule Profile

DATE

May 2009

BUDGET ACTIVITY

05 System Development and Demonstration (SDD)

PE NUMBER AND TITLE

0604602F Armament/Ordnance
Development

PROJECT NUMBER AND TITLE

3133 Armament Subsystems

Hard Target Void Sensing Fuze

JCTD Schedule

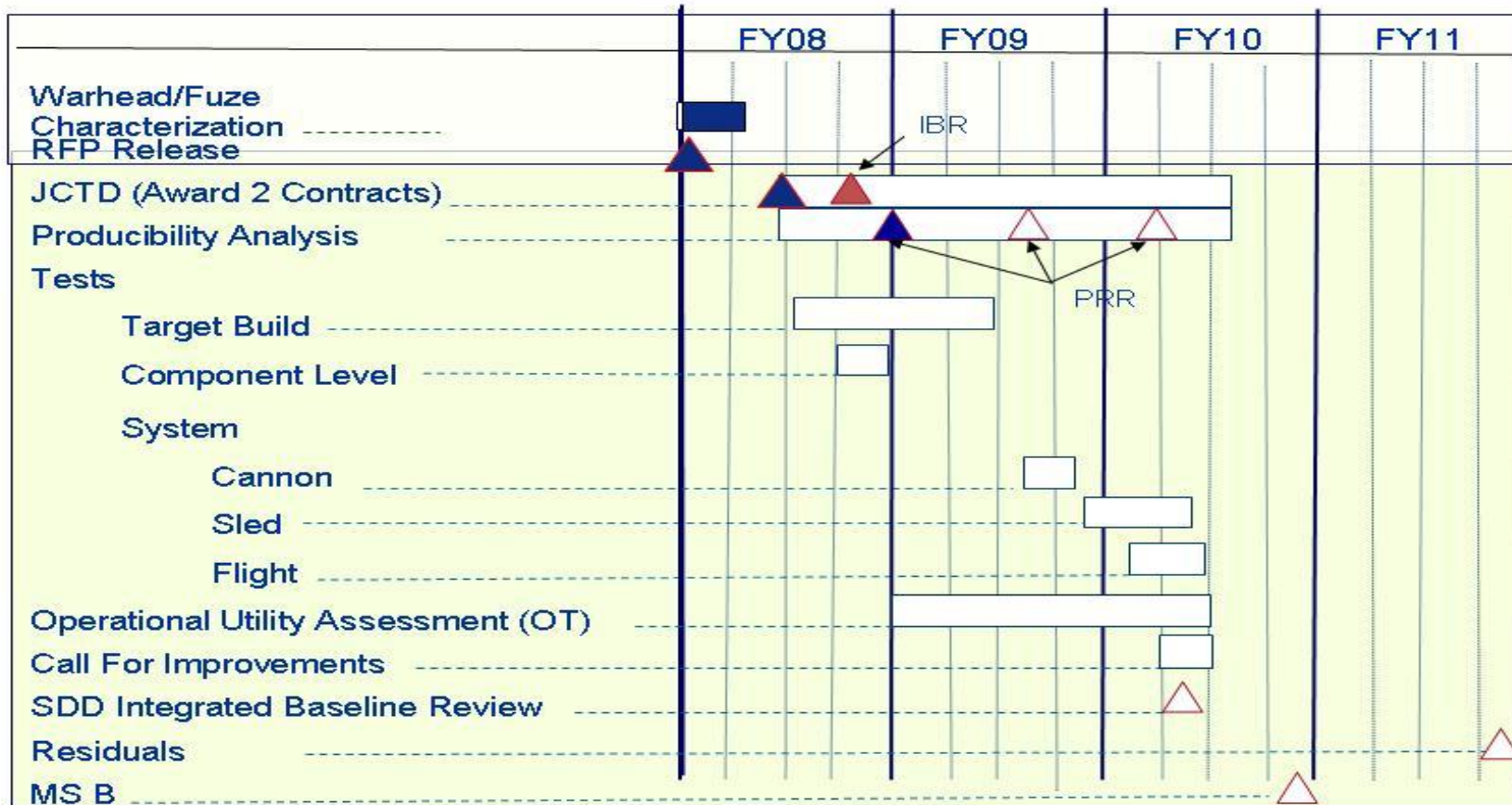


Exhibit R-4, RDT&E Schedule Profile		DATE May 2009
BUDGET ACTIVITY 05 System Development and Demonstration (SDD)	PE NUMBER AND TITLE 0604602F Armament/Ordnance Development	PROJECT NUMBER AND TITLE 3133 Armament Subsystems
<p>The Fuze, Insensitive Munitions (IM), Munitions Materiel Handling Equipment (MMHE), and Munitions Container programs are continuing activities that support fuze development, IM compliance, MMHE design and development, and container standardization activities throughout the year. IM strategic planning is also an ongoing activity.</p>		
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Exhibit R-4a, RDT&E Schedule Detail

DATE

May 2009

BUDGET ACTIVITY

05 System Development and Demonstration (SDD)

PE NUMBER AND TITLE

0604602F Armament/Ordnance
Development

PROJECT NUMBER AND TITLE

3133 Armament Subsystems

	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
(U) Schedule Profile			
(U) FUZES: JPF Integration on Legacy Weapons & Other Fuze Activity	1-4Q	1-4Q	1-4Q
(U) HTVSF JCTD	3-4Q	1-4Q	1-4Q
(U) HTVSF JCTD - MS B, Contractor Downselect			4Q
(U) Insensitive Munitions (IM) Strategic Planning	1-4Q		
(U) Hard Target Void Sensing Fuze (HTVSF) Characterization Study	1-4Q		
(U) Eglin Steel Producibility Enhancement (ESPE)	1-4Q		
(U) I-1000 Warhead Technology Demonstration	3-4Q	1-3Q	
(U) Study, design, and test MMHE	1-4Q	1-4Q	1-4Q
(U) Support CDRS Activities/Meetings	1-4Q	1-4Q	1-4Q

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Project 3133

Exhibit R-4a (PE 0604602F)

Exhibit R-2a, RDT&E Project Justification

DATE

May 2009

BUDGET ACTIVITY

05 System Development and Demonstration (SDD)

PE NUMBER AND TITLE

0604602F Armament/Ordnance
Development

PROJECT NUMBER AND TITLE

5361 Stores-Aircraft Interface

Cost (\$ in Millions)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost to Complete	Total
5361 Stores-Aircraft Interface	0.000	0.000	6.685	0.000	0.000	0.000	0.000	0.000	Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0		

In FY 2010, Project 5361, Stores-Aircraft Interface (new), efforts were transferred from PE 0605011F, RDT&E for Aging Aircraft, Project 654685, Universal Armament Interface (UAI), in order to properly fund the maturing technology.

(U) **A. Mission Description and Budget Item Justification**

Universal Armament Interface (UAI) is an Air Force initiative to develop, enhance, and implement standardized interfaces in aircraft, weapons and mission planning to support integration of weapons independent of aircraft Operation Flight Program (OFP) cycles. UAI is currently being implemented on the F-15E and F-16 Block 40/50 aircraft, Small Diameter Bomb (SDB) I and II, Joint Direct Attack Munition (JDAM), Joint Air-to-Surface Stand-off Missile (JASSM) and Precision Guided Munitions Planning Software (PGMPS). Additional aircraft and weapons have program plans to implement UAI. The UAI program office is responsible for development and enhancement of the standard, provision of certification tools (test assets) and implementation support to aircraft and weapons.

The UAI efforts were transferred (1) to ensure continued funding for UAI through the FYDP (PE 0605011F will be zeroed out in FY 2010 due to higher Air Force priorities), and (2) to properly fund the maturing technology. The new project number is established to provide greater visibility into UAI's budget. Funding UAI via the Arm/Ord PE will ensure that platform and weapon program offices have the support required to implement and update UAI.

This program is in Budget Activity 5 - System Development and Demonstration (SDD) because it supports armament integration, an SDD-type activity.

(U) **B. Accomplishments/Planned Program (\$ in Millions)**

	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>
(U) ICD Dev/Updates			5.702
(U) UAI Common Component			0.786
(U) Certification Tool			0.197
(U) Total Cost	0.000	0.000	6.685

This is not a new start; these efforts were performed under PE 0605011F, RDT&E for Aging Aircraft, in FY 2008 and FY 2009.

(U) **C. Other Program Funding Summary (\$ in Millions)**

	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) N/A										

(U) **D. Acquisition Strategy**

In December 2004, under the authority of a class Justification and Approval (J&A), the UAI program office awarded individual Cost Plus Fixed Fee (CPFF) contracts to Boeing, Lockheed-Martin, Northrop-Grumman and Raytheon. These four vendors are the Original Equipment Manufacturers (OEMs) for approximately 90% of the Department of Defense' platforms and weapons. Each OEM is responsible for a different piece of the total UAI requirement based on its platform or weapon expertise.

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Exhibit R-2a, RDT&E Project Justification		DATE May 2009
BUDGET ACTIVITY 05 System Development and Demonstration (SDD)	PE NUMBER AND TITLE 0604602F Armament/Ordnance Development	PROJECT NUMBER AND TITLE 5361 Stores-Aircraft Interface
<p>The current contracts expire in December 2009 and acquisition strategy planning for continuation of the program in January 2010 is in process.</p>		
<p>Project 5361</p>		

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Exhibit R-3, RDT&E Project Cost Analysis										DATE May 2009			
BUDGET ACTIVITY 05 System Development and Demonstration (SDD)					PE NUMBER AND TITLE 0604602F Armament/Ordnance Development					PROJECT NUMBER AND TITLE 5361 Stores-Aircraft Interface			
(U) Cost Categories (Tailor to WBS, or System/Item Requirements) (\$ in Millions)	Contract Method & Type	Performing Activity & Location	Total Prior to FY 2008 Cost	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	FY 2010 Cost	FY 2010 Award Date	Cost to Complete	Total Cost	Target Value of Contract	
(U) Product Development													
Interface Control Document (ICD) Development/Updates	SS/CPFF	Boeing/NG/L M/Raytheon/V arious						5.014	Oct-09	Continuing	TBD	TBD	
UAI Common Component Certification Tool	SS/CPF SS/CPF	NG Boeing/NG/L M/Raytheon/V arious						0.786 0.197	Oct-09 Oct-09	Continuing Continuing	TBD TBD	TBD TBD	
Subtotal Product Development Remarks:			0.000	0.000		0.000		5.997		Continuing	TBD	TBD	
(U) Support													
Subtotal Support Remarks:			0.000	0.000		0.000		0.000		0.000	0.000	0.000	
(U) Test & Evaluation													
Subtotal Test & Evaluation Remarks:			0.000	0.000		0.000		0.000		0.000	0.000	0.000	
(U) Management													
Program Management Administration/Program Support	T&M, FFP	Various						0.688	Oct-09	Continuing	TBD	TBD	
Subtotal Management Remarks:			0.000	0.000		0.000		0.688		Continuing	TBD	TBD	
(U) Total Cost			0.000	0.000		0.000		6.685		Continuing	TBD	TBD	
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Project 5361

Exhibit R-3 (PE 0604602F)

Exhibit R-4, RDT&E Schedule Profile

DATE

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05 System Development and Demonstration (SDD)

PE NUMBER AND TITLE

0604602F Armament/Ordnance
Development

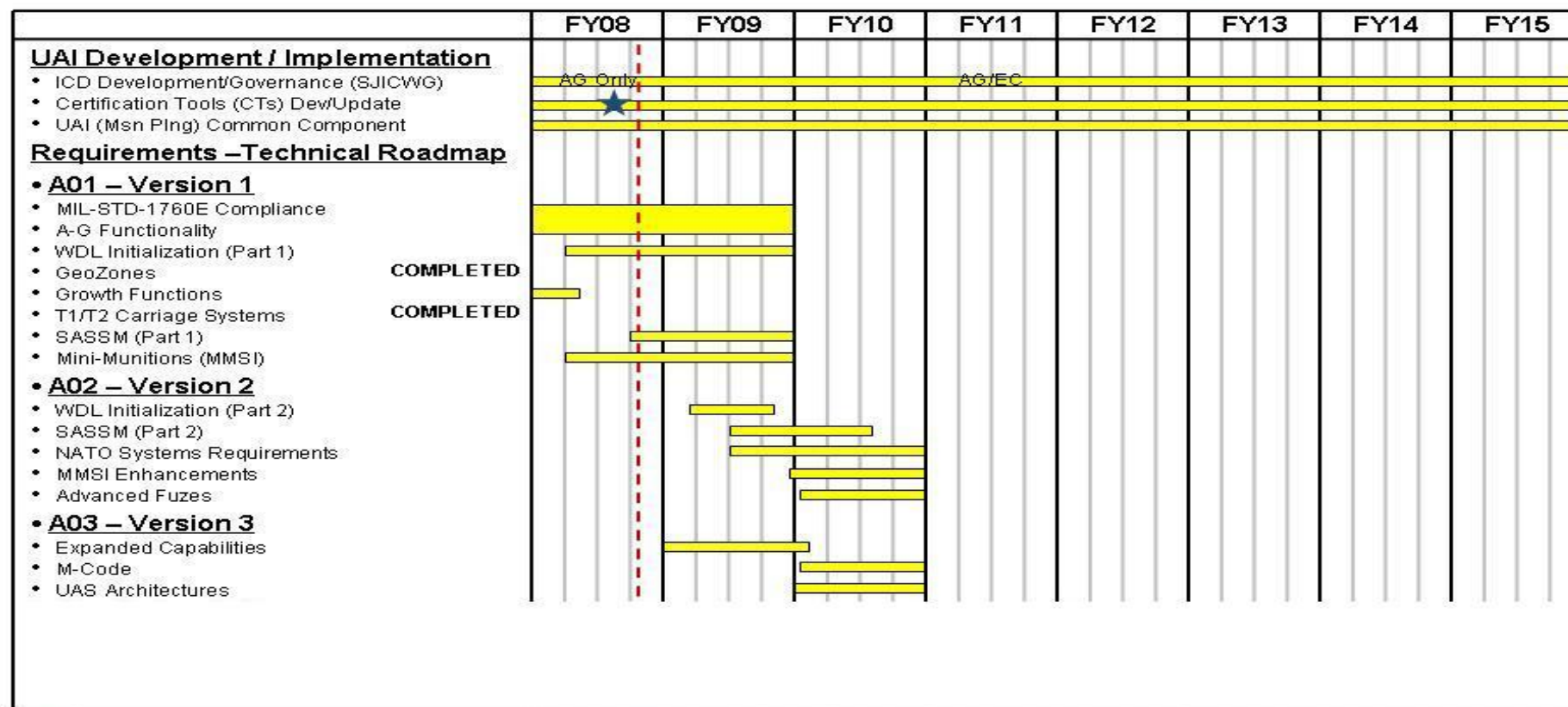
PROJECT NUMBER AND TITLE

5361 Stores-Aircraft Interface



FOR OFFICIAL USE ONLY

UAI Technical Roadmap


Dominant Air Power: Design For Tomorrow... Deliver Today


★ Field as UAI

FOR OFFICIAL USE ONLY

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Exhibit R-4 (PE 0604602F)

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Exhibit R-4a, RDT&E Schedule Detail

DATE

May 2009

BUDGET ACTIVITY

05 System Development and Demonstration (SDD)

PE NUMBER AND TITLE

0604602F Armament/Ordnance
Development

PROJECT NUMBER AND TITLE

5361 Stores-Aircraft Interface

(U) Schedule ProfileFY 2008FY 2009FY 2010

(U) A01 - Version 1

1-4Q

1-4Q

(U) A01 - Version 2

2-4Q

1-4Q

(U) A03 - Version 3

1-4Q

1-4Q

In FY 2008 and FY 2009, these efforts were performed under PE 0605011F, RDT&E for Aging Aircraft.

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